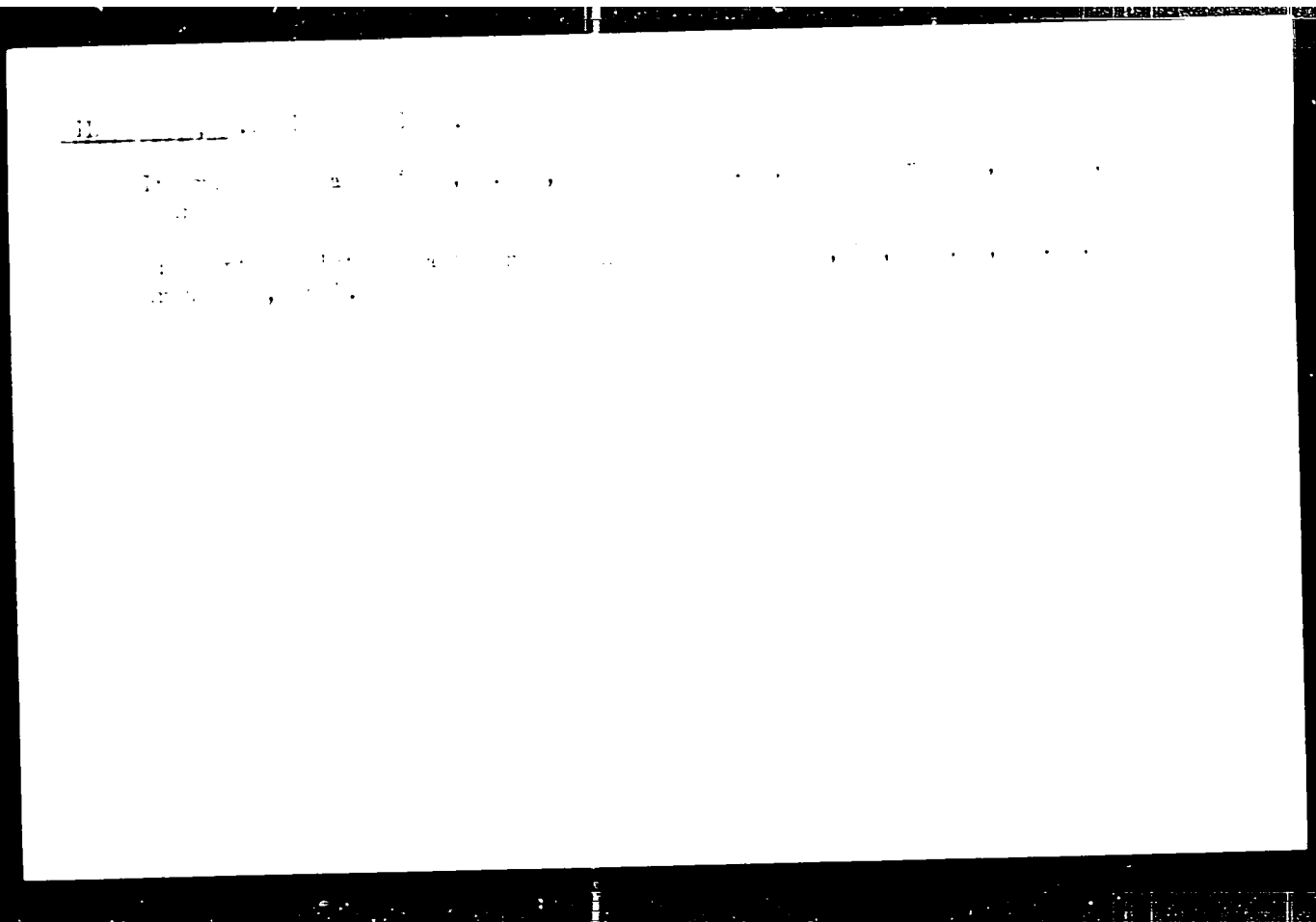




Subject : USSR Engineering AID P - 4927

Card 1 1 Pub. No. - 11/17

Author : Piltakyan, A.

Title : Kinescope 40LK1B in the "KVN-49-4" type television receiver.

Periodical : Radio, 7, 41-44, J1 1956

Abstract : The author describes the adjustments necessary to adapt the kinescope 40LK1B for the "KVN-49-4" type television receiver. Adjustments are more complicated than for the "KVN-49" type of receiver. One connection diagram, 4 drawings.

Institution : None

Submitted : No date

PILTAKYAN, A.

Television projector. Radio no.3:44-48 Mr '60. (MIRA 13:6)
(Television)

PILTAKYAN, A.

The 401K1B kinescope in the "KVN-49-4" television receiver. Radio
no. 7:41-44 J1 '56. (MIRA 9:9)
(Television--Picture tubes)(Television--Receivers and reception)

PILTAKYAN, A.

Change in the staggered scanning circuit of the KVB-49 television set.

Radio no.5:35 My '54.

(MLRA 7:5)

(Television--Receivers and reception)

PILTAKYAN, A.

Using the 6ZhP pentode in low-frequency amplifying cascades.
Radio no. 4:53 Ap '55. (MLR 8:6)
(Electron tubes)

PILTAKYAN, A., inzh.

Television attachment with a 110" picture tube. Radio no. 91
37-39 S '62. (MIRA 15:0)

(Television)

PILTAKYAN, A.

Corrective magnets for a cathode-ray tube with electron trap.
Radio no.7:37-38 JI '54. (MIRA 7:7)
(Cathode-ray tubes)

PILTAKYAN, A.

Television receiver. Radio no. 7:25-28 J1 '60.

(MIRA 13:7)

(Television—Receivers and reception)

PILTAKYAN, A., inzh.

6Zh9P pentode for use in television receivers. Radio no. 5140-41
My '63. (MIRA 16:5)
(Electron tubes) (Television--Equipment and supplies)

PILTAKYAN, A., inzh.

A television receiver. Radio no. 1.26-29 sa '65.
(Television--Receivers and reception)

(MIRA 1.1.1)

PILTAKYAN / inzh.

There first television presentation, dated 1962, is in the
film "The

PILTAKYAN, A., 1921.

Com o sistema de avaliação por pares, os alunos são capazes de avaliar os trabalhos dos colegas e isso ajuda a melhorar a qualidade do trabalho.

PILTAKYAN, A. inzh.

Video-frequency amplifiers using new electron tubes Radio
no. 7.36-38 J1 '62. (MIRA 16.6)

(Amplifiers, Electron tube)

PILTAKYAN, A.

USSR/ Miscellaneous

Card 1/1 Pub. 89 - 28/28

Authors : Klyukachev, V.; Gol'dreer, I.; Roginskiy, V.; Piltakyan, A.; and Gutkin, E.

Title : Exchange of experiments

Periodical : Radio 4, pages 48, 53, and 63, Apr 1955

Abstract : The following subjects and items are briefly discussed and described: A two-voltage rectifier used for rectification of the 300-320 and 130-150 volt plate circuits in a cathode-ray tube; electronic compensators for stabilizing power feeds; the use of the 6Zh2P pentode as an amplifier; the semi-duplex operation during amateur radio communications; and the contest of amateur radio clubs in establishing radio communication with Experimental Arctic Stations No. 3, and No. 4. Circuit diagrams; graphs; tables.

Institution :

Submitted :

PILTAKYAN, A.

USSR/ Electronics

Card 1/1 **Pub.** 89 - 24/28

Authors : Piltakyan, A.

Title : The substitution of a vibration-inverter with a thyatron

Periodical : Radio 4, 52-53, Apr 1955

Abstract : The use of a thyatron in place of a vibration-inverter to supply alternating-current from a direct-current supply is discussed, together with a description of thyatron components, relaxation oscillator and an explanation of oscillating processes and capacitance. Graphs; diagrams.

Institution :

Submitted :

PILTAKYAN, A.

USSR/ Electronics - Electromagnets

Card 1/1 : Pub. 89 - 19/29

Authors : Piltakyan, A.

Title : Corrective magnets for a cathode-ray tube with an ion trap

Periodical : Radio 7, 37-38, July 1954

Abstract : Corrective electromagnets used by radio-amateurs, in the absence of permanent magnets, for the deflection of the cathode ray in 18LK2B(18 JK2B) and 40LK1B(40 K1B) tubes, are described. The general view of the electromagnets and diagrams of their component parts are shown, and data on the coil windings given. The adjustment of the electromagnets, in the process of operation of each of the above-mentioned cathode-ray tubes, assembled in their respective sets, is explained in detail.

Institution : ...

Submitted : ...

PILTAKYAN, A.

USSR/Electronics - Television

Card 1/1

Author : Piltakyan, A.

Title : Method of changing the Line-Scanning Scheme of the KBH-49 (KVN-49) Television Set.

Periodical : Radio. 5, 35, May 1954

Abstract : A short article is presented which deals with a specific problem of adapting cathode-ray tubes of the 18LK15 and 23LK1B types for use in the KBH-49 television set. In order to completely cover the larger screens of these tubes, the beam must be correspondingly deflected. This deflection is obtained by an appropriate change in the layout of the terminal stage of the television set. A diagram illustrating this method is shown.

Institution :

Submitted :

SED'ARYAN, A., 1921.

IF possible, obtain a copy of the book "Sed'aryan, A. 1921."
with a view to its being translated.

W. A. 1921.

PILTAKYAN, Artur Mesropovich; TARASOV, P.I., red.; LARIONOV, G.Ye., tekhn.
red.

[Eleven-tube television set] Odinnadtsatilampovyi televizor. Moskva,
Gos. energ. izd-vo, 1958. 31 p. (Massovaya radiobiblioteka, no.295).
(Television--Receivers and reception) (MIRA 11:7)

ALEKSEYEV, S.M.; BOL'SHOV, V.M.; VITKOV, M.G.; GUKIN, V.I.; IVANOV,
V.M.; MALININ, R.M.; PILTAKYAN, A.M.; PLENKIN, Yu.N.;
SOBOLEVSKIY, A.G.; BURLYAND, V.A., red.; BORUNOV, N.I.,
tekhn. red.

[Handbook for beginning radio amateurs] Spravochnik nach-
naiushchego radioliubitelia. Pod obshchei red. R.M.Malinina.
Izd.2., stereotipnoe. Moskva, Gosenergoizdat, 1963. 623 p.
(Massovaya radiobiblioteka, no.400) (MIRA 16:5)
(Radio--Handbooks, manuals, etc.)
(Radio operators--Handbooks, manuals, etc.)

ZIN'KOVSKIY, Abram Isaakovich; PILTAKYAN, A.M., red.; BORUNOV, N.I.,
tekhn.red.

[Radio engineering and space flights] Radiotekhnika i kosmicheskie
polety. Moskva, Gos.energ.izd-vo, 1960. 47 p. (Massovaya radio-
biblioteka, no.388) (MIRA 14:4)
(Radio) (Space flight)

"APPROVED FOR RELEASE: 06/15/2000

CIA-RDP86-00513R001340910007-6

APPROVED FOR RELEASE: 06/15/2000

CIA-RDP86-00513R001340910007-6"

PILTAKYAN, A.

Attachment for a television receiver. Radio no. 5:29-32 My '60.

(MIRA 13:12)

(Television—Equipment and supplies)

PHASE I BOOK EXPLOITATION

992

Piltakyan, Artur Mesropovich

Odinnadtsatilampovyy televizor (Eleven-Tube Television Set) Moscow, Gosenergoizdat, 1958. 31 p. (Series: Massovaya radiobiblioteka, vyp. 295) 95,000 copies printed.

Ed.: Tarasov, F. I.; Tech. Ed.: Larionov, G. Ye.; Editorial Board of Series: Berg, A. I., Burlyand, V. A., Vaneyev, V. I., Genishta, Ye. N., Dzhigit, I. S., Kanayeva, A.M., Krenkel', E.T., Kulikovskiy, A.A., Smirnov, A.D., Tarasov, F.I., Chechik, P.O., Shamshur, V.I.

PURPOSE: This brochure is addressed to radio amateurs familiar with the construction of television receivers.

COVERAGE: The brochure describes an eleven-tube television set using the 35LK2B kinescope. The set described here is for reception

Card 1/2

AUTHOR: Fil'tenko, V.P.

TITLE: Petro-terrestrial coordinates and the fields of their variation
 Petrokhimicheskiye koordinaty i polya ikh raznoobraziya

PERIODICAL: Byulleten' Vostochnogo nauchno issledovaniya tsentra
 Idel goslogicheskoy, 1980, vol. 1, no. 1, p. 111-117

ABSTRACT: The author suggests a new method of determining mineral com-
 pounds of granitic rocks. In contrast to other methods,
 this one is units the albite molecules contained in the com-
 position of potassium feldspar and plagioclase. The petro-terrestrial
 coordinates are computed according to a formula devised by
 A.V. Ivanitskiy:

$$\lambda = \frac{a}{s} \quad \text{and} \quad \varphi = \frac{b+c}{s}$$

where λ is the indicator of albedoity representing the ratio
 of the sum of dark-colored and albite to albite

1. Rock--Analysis 2. Minerals--Determination

Card 1

RADCHENKO, Yu., assistant; FIL'YENKO, V., agronom; CHENKIN, A.

Cabbage moth *Barantra brassicae* is a dangerous pest. Zashch.rast.
ot vreditel' bol. 10 no.4:5-7 '5. (MIRA 18:6)

1. Kafedra zoologii i entomologii Khar'kovskogo sel'skokhozyaystvennogo
instituta (for Filichenko). 2. Zameshitel' nachal'nika Upravleniya
zashchity rasteniy RSFSR (for Chenkin).

PILTER, Pal

Up-to-date production methods in crude-iron manufacture. Koh lap
93 no.11:512-517 N '60.

1. Dunai Vasmu fomernoke.

VINOGRADOVA, Ye.V.; GRINEV, A.N.; DANUSEVICH, I.K.; DZIK, M.F.; DUBOVIK, B.V.;
ZAKHAREVSKIY, A.S.; IL'YUCHENOK, T.Yu.; KOST, A.N.; MARTINOVICH, G.I.;
MUKLEVICH, A.V.; PIL'TIYENKO, L.F.; RACHKOVSKAYA, I.V.; REUT, N.A.;
TALAPIN, V.I.; TAMARINA, N.Z.; TERENT'YEV, A.P.; SHADURSKIY, K.S.

Research on pharmacological agents with prolonged hypotensive
action. Vest. AN SSSR 18 no.1:69-86, 1983. (MIRA 16:1)

1. Laboratoriya spetsial'nogo organicheskogo sinteza khimicheskogo
fakul'teta Moskovskogo gosudarstvennogo universiteta imeni Lomonosova i kafedra farmakologii Minskogo meditsinskogo instituta.
(HYPOTENSION) (INDOLE)

PIL'TIYENKO, L.F., assistant

Effect of phenothiazine derivatives and indole on blood pressure, pulse, respiration and body temperature in an experiment. Zdrav. Bel. 8 no.4:36-39 Ap '62. (MIRA 15:6)

1. Kafedra dermatologii Belorusskogo instituta usovershenstvovaniya vrachey (zaveduyushchiy kafedroy - dotsent N.F. Pavlov) i kafedra farmakologii Minskogo meditsinskogo instituta (zaveduyushchiy kafedroy - professor K.S. Shadurskiy).

(PHENOTHIAZINE)

(INDOLE)

(BLOOD)

(RESPIRATION)

(BODY TEMPERATURE)

KLOPOV, Aleksandr Yakovlevich; PILTOKON, A.M., redaktor; SKVORTSOV, I.M.,
tekhnicheskiiy redaktor

[Television engineering] Tekhnika televideniia. Moskva, Gos. energ.
izd-vo, 1956. 78 p. (Massovaya radiobiblioteka, no. 247) (MIRA 9:10)
(Television)

PIL'TSER, S.M.

Simultaneous knitting of the turn-down collar and binding in
the manufacture of knit jackets. Leh. prom. no.2:58-59
Ap-Je '63. (MIRA 16:7)

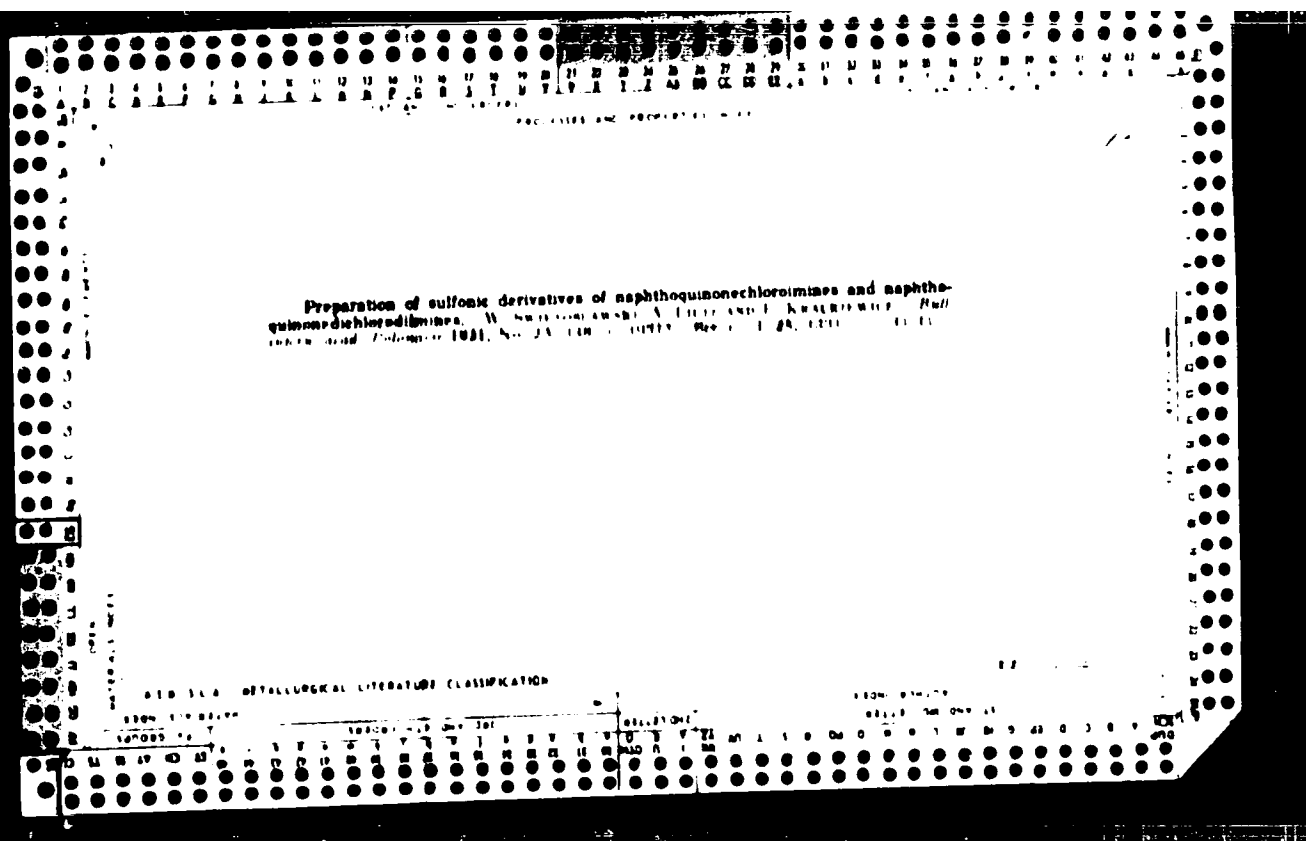
1. Khar'kovskaya trikotazhnaya fabrika No.2.

(Knit goods)

6-3

Sulfonic acid derivatives of naphthalene-1-chloramine and 2-chloramine. W. SWISTONOWSKI, A. PAUL, and F. KRAKOWSKI (Bull. Chem., 1931, 15, 85-88).—Potassium p-naphthalene-1-chloro-imino-4-sulfonate, the corresponding 1-bromo-derivative, potassium p-naphthalene-2-chlorimine-4-sulfonate, and α-naphthalenedichlorimine-8-sulfonate are prepared by halogenating the appropriate aminonaphthalene or naphthalenetransimino-sulfonic acid and salting out the product with potassium chloride as formed at a low temperature.

R. TRUBNOWSKI.



1. The first part of the document is a list of the names of the persons who were present at the meeting. The names are listed in alphabetical order.

PILTZ, Włodzimierz, mgr inż.

The 2 500 TDW freezer trawler. Bud okrętowe Warszawa 8
no.5:159-161 My '63.

1. Centralne Biuro Konstrukcji Okrętowych Nr 1, Gdansk.

GADALIN, V.N.; ZEMIN, A.S.; ILLUGAN VA, A.A.

Investigating kinematic parameters of the SKbS-1,2 cotton
harvesting machine. Trakt. i sel'khoz mash. 31. no.6:27-30
Je '61. (MIRA 14:6)

1. Gosudarstvennoye spetsial'noye konstruktorskoye byuro po
khlop'kouborke.
(Cotton-picking machinery)

PILULEVSKIY, G.V.

✓9778 (Russian.) A Study of Myrcene Dioxide. K. Isakodov.
 anilin dioksid iskusstva. G. V. Pilulevskiy and N. A. Adrova.
 Zhurnal Obshchey Khimii, v. 27, Jan. 1957, p. 136-137.
 The structure 2, 3, 6, 6'-dioxide-2-methyl-6-methylene-octene
 7 (III) was due to myrcene dioxide forming during the oxida-
 tion of myrcene by hydrogen peroxide. During the hydration of
 myrcene dioxide a dihydromyrcene dioxide was formed.

PILYUGIN, A.A.

Efficient bitumen distilling plant. Avt.dor.18 no.4:26-27 J1-Ag'55
(Bitumen) (MLRA 8:11)

PILVA, L.

"Several interesting examples of resistance welding applications used in the Czechoslovak industry."

p. 9 (Czechoslovak Heavy Industry, no. 5, 1958, Praha, Czechoslovakia)

Monthly Index of East European Accessions (EEAI) LC, Vol. 7, no. 9,
September 1958

PILULIK, L.G.; DREYTSER, F.F.

Shift in the electron spectra of phthalimides in solutions as
affected by temperature. Dokl. AN BSSR 5 no. 2:57-60 F '61.
(MIRA 14:2)

1. Institut fiziki AN BSSR. Predstavleno akademikom AN BSSR
A.N. Sevchenko.

(Phthalimide--Spectra)

OFFICE OF THE DIRECTOR, FBI

MEMORANDUM FOR THE DIRECTOR, FBI
FROM: SAC, NEW YORK (100-100000)
SUBJECT: [REDACTED]

11. VINO. A.

New harvesting machine in the field of the village.

p. 414 (original) - Bibliography. Vol. 1, no. 1, 1971, 1972, 1973.

NO. 11. VINO. A. - Bibliography. Vol. 1, no. 1, 1971, 1972, 1973.

L 32668-66 EWT(m)/EWP(w)/EWP(k)/T/EWP(t)/ETI IJP(c) JD/GD/JH
 ACC NR: AT6016407 (A) SOURCE CODE: UR/0000/65/000/000/0028/0036

AUTHORS: Livanov, V. A.; Pil'vinskiy, A. I.

ORG: none

TITLE: Influence of pressure on the properties of cast aluminum alloy D16 / 9

SOURCE: AN SSSR, Institut metallurgii. Metallovedeniye legkikh splavov (Metallography of light alloys). Moscow, Izd-vo Nauka, 1965, 28-36

TOPIC TAGS: aluminum, aluminum alloy / D16 aluminum alloy

ABSTRACT: The effect of pressure of up to 100 kg/mm^2 applied at $520-550^\circ\text{C}$ on the mechanical properties of cast aluminum alloy D16 was investigated. The microstructure strength limit and percentage elongation of the specimens were determined as a function of the applied pressure and temperature (see Fig. 1). It was found that application of pressure to the alloy enhanced its mechanical properties. The enhancement was less pronounced if the specimens were subjected to prolonged homogenization treatment. The effect of pressure on the mechanical properties was more pronounced for those alloys which showed the presence of a liquid phase during compression.

Cord 1/2

L 32668-66

ACC NR: AT6016407

2

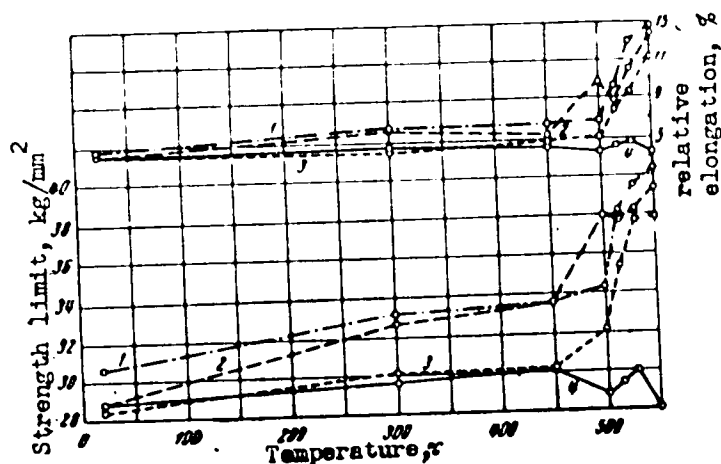


Fig. 1. Mechanical properties of annealed cast alloy D16 as a function of temperature during compression with various pressures.

Pressure, kg/mm²: 1 - 100; 2 - 50; 3 - 10; 4 - no pressure.

Orig. art. has: 4 tables and 8 figures.

SUB CODE: 11/ SUBM DATE: 16Sep65/ ORIG REF: 004

Cord 2/2 BLG

INDUST, R.

The seed is secured in the fall. . 145.

GAI, MOD. I TECHNIKA SANITARNA (Stowarzyszenie Naukowo-Techniczne
Inzynierow i Technikow Sanitarnych, Przemictwa i Garsownictwa.
Warszawa, Poland, Vol. 13, no. 8, Aug 1958.

Monthly list of East European Accession (GAI, Vol. 13, no. 8, Feb. 1960

Uncl.

PILIABSEIY, V.I., SAVINA, A.A., red.: KOLESOVA, Z.M., tekhn.red.

[Palace Square] Dvortsovnaya ploshchad'. Leningrad, Gos.izd-vo
"Iskusstvo," 1958. 78 p. (MIRA 11:9)
(Leningrad--Description)

PAVLOV, N.V., inzh.; MAR'YAMCHIK, I.I., inzh.; Pilyagin, V.F., inzh.

Boiler units with liquid slag removal. Energomashinostroenie 11 no.7:
1-5 J1 '65. (MIRA 18:7)

L 21685-66

SOURCE CODE: UR/0096/65/000/012/0019/0021

ACC NR: AP6015524

AUTHOR: Zorichev, V. A. (Engineer); Pavlov, N. V. (Engineer); Pilyagin, V. F. (Engineer) 40
B

ORG: Barnaul Boiler Factory (Barnaul'skiy kotel'nyy zavod)

TITLE: Use of the MEI "plane parallel flow" combustion devices in BKZ boilers

SOURCE: Teploenergetika, no. 12, 1965, 19-21

TOPIC TAGS: furnaces, combustion, fuel, steam boiler/BKZ-75-39 FB steam boiler, BKZ 160-100F steam boiler, BKZ 210-140F steam boiler, BKZ 220-100F steam boiler

ABSTRACT: The basic burners for the combustion of fine peat and lignite in boilers are presently the open breast burners with dissectors or ejection shafts. These devices are not very efficient (see, e.g., A. P. Kovalev, D. M. Khzmalyan, Teploenergetika (Heat Power Engineering), No 1, 1957). Consequently, the department of steam generator design of the MEI carried out numerous investigations of the problem, resulting in the construction of a new combustion device using the cut turf in which the fuel burns in plane parallel flows bringing the air-powder mixture into the furnace through narrow vertical slits at a speed of 20-30 m/sec. From 1956 tests were carried out jointly by the MEI and the construction bureau of the BKZ and BKZ 75-39FB (E-75/40), BKZ 160-100F (E-160/100), BKZ 210-140F (E-210/140), and BKZ 220-100F (E-220/100) boilers equipped with the new combustion devices. Among MEI personnel participating in the investi-

Card 1/2

L 24685-66

ACC NR: AP6015524

gation were also A. V. Patrikeyev, R. A. Molchanov, Z. V. Matveyeva, I. A. Shingel', and I. Ye. Grigor'yev. Extensive tests, described briefly in the article, show that the new method is by far the most economical for the combustion of low-calory fuels. The new method does away with the need for an auxiliary inlet for secondary air at the back wall of the furnace (in the case of cut turf with less than 50% moisture content one can even remove the ignition belt. The future investigation will study the use of the new device for the combustion of lignite. / Orig. art. has: 2 figures and 2 tables. [JPRS]

SUB CODE: 21, 13 / SUM DATE: none / ORIG REF: 004

Card 2/2 FW

PILYAGIN, V.V.

Contribution to the theory of frequency conversion using nonlinear active resistance. Radiotekhnika 19 no. 1:47-52 S '64. (Mink 1:10)

FRANTSEVICH, I.N.; PILYANKEVICH, A.N.

Electron microscope examination of fractures of cermetes (micro-
graphic analysis of fractures). Inzh.-fiz.smur. no.10:47-54
0 '58. (MIRA 11:11)

1. Insitut metallokeramiki i spetsial'nykh splavov AN USSR, g.Kiyev.
(Cermetes--Metallography) (Electron microscopy)

A. MOKH. Ilyazov, A. M.

TITLE: The Method of Double-Stage Imprints for Electron Microscopy
Preparation of Cross-Sectional Views (Metod brayatsyazhki
preparatsii dlya elektronomikroskopicheskogo preparirovaniya
izobrazheniya)

PERIODICAL: Izvestiya Akademiya Nauk SSSR, Vol. 4, No. 1, pp. 114-117 (USSR)

ABSTRACT: For the purpose of obtaining easily producible high-quality im-
prints of the surface of brittle metallic-ceramic bodies was worked
out a method for the investigation of the surface of brittle metallic-ceramic bodies
which can also be used for metal, ceramic, glass- and other
bodies having a rough surface. For the first imprints cleaned
film waste was used. The surfaces, which were moistened a little
with acetone (waiting time 10-30 seconds), of the sample and of
the film waste are pressed together for 10-15 minutes
until the film again becomes transparent, after which it is removed. The
second imprint is produced by right-angled vacuum powdering of
the surface of contact between film and sample, i.e.
of the first imprint is left, by means of which a clear or partial

The Method of Double-Stage Imprint for
Electron Microscopy Investigations of
Crystalline Structures

After preparation the surface of the specimen is the electron-
microscopically investigated. For black-and-white contrast
reproduction a maximum intensity of 1% and 0.5% respectively was
obtained corresponding to 100 Å, so that a sharpness of 100 Å
may be expected in good microphotographs. There are 2 figures.

ASSOCIATION: Institut für Metallkeramik und Special Alloy AS Ukrainian
SSR (Institut metallkeramicheskoy metalloykhi, Lviv Akademi
metall. USSR)

AVAILABLE: Library of Congress

1. Electron microscopes-Applications 2. Materials-Imprint copies

AUTHOR: Pilyankevich, A. N.

TITLE: The Application of the Replica Method to Fractography
(Primeneniye metoda otpechatkov dlya fraktografii)

PERIODICAL: Zavoiskaya Laboratoriya, 1958, Vol. 24, Nr 1, pp. 849-859
(USSR)

ABSTRACT:

In customary fractographic investigations no correct picture of the rupture is obtained, as only bright sites of the rupture are investigated. This method is used for electron microscopical investigations. X-ray films treated with acetone are used as replicas. Some microphotographs which were obtained on a MIM-6 microscope by transmission imaging are given. From the measurements it is found that by this method more accurate results can be obtained than with an optical microscope. As compared to another, earlier described method of a transmission investigation of replicas of the surface of non-transparent bodies this method offers the advantage of being more simple and of taking less time. Moreover, it is less difficult to strip the replicas. Due to the sufficient mechanical strength and elasticity of the replicas they are not deformed in strip-

Cont 1/2

SOV/32-24-7-25/65

The Application of the Replication Method to
Fractography

ping. Hence, they exhibit no deformations of relief. This method is also applicable to the investigation of other non-transparent bodies with a coarse relief. A microphotograph of a replica of a graphite film with crystals of silicon carbide, which was produced by sublimation from the gaseous phase, is given. There are 3 figures and 2 references, 1 of which is Soviet.

ASSOCIATION:

Institut metallurgicheskoi i spetsial'nykh spлавov Akademii nauk SSSR (Institute of Powder Metallurgy and Special Alloys, AS USSR)

Card 2/2

28 (5)
AUTHORS: Pilyankevich, A. N., Kachkovskaya, E. T. SOV/32-25-6-35/53
TITLE: Production of Titanium Replica for the Electron Metallography
(Polucheniye titanovykh otpechatkov dlya elektronnoy metallografii)
PERIODICAL: Zavodskaya Laboratoriya, 1959, Vol 25, Nr 6, pp 741-744 (USSR)
ABSTRACT: The method of the production of replica carried out in two steps is described. During the first stage a collodion replica (I) is made of the surface to be investigated, next it is separated from the surface, a titanium film is sprayed on to the contact surface of (I) and in the second stage this titanium film is separated as a replica. The titanium film sprayed on to (I) has a thickness of 100 Å and is isolated by the dissolution of collodion in acetone. As this titanium film has a low mechanical strength it is possible to attain a consolidation by means of a gelatin or a paraffin solution in connection with the separation of the replica. The method of double collodion-titanium replica was successfully employed for the purpose of investigating metallographic ground sections of powder metallurgical materials (figure 2.

Card 1/2

Production of Titanium Replica for the Electron
Metallography

SOV '82-25.5-35 '83

section of a silicon-silicon carbide composition. Surfaces with a highly developed relief are investigated according to a somewhat modified method (Ref 1). There are 2 figures and 2 references, 1 of which is Soviet.

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii nauk USSR (Institute of Powder Metallurgy and Special Alloys of the Academy of Sciences, UkrSSR)

Card 2/2

PLATE 1: ROCK EXPOSITION 507 a. v.

[illegible]

21 of Publishing House : V. Laidin T.O. 21 A.A. Semyonova
 Board: G.V. Semakova (No. 21), I.N. Prutskov (No. 21),
 A.L. Medvedev, and N.I. Krasovskiy.

REMARK: The book is intended for engineers, a facility engineer and others specializing in reference materials in their capacities, or for maintaining, electrical, mechanical building and industrial buildings in a house of different technical direction.

CONTRACT This collection of papers, originally prepared for the Seminar on Economic Materials in Kyoto on June 13-14, 1964.

[illegible]

Application to the Bureau, Bureau Office
Bureau

Prisoner's, I.S., and A.S. Prisoner's
of the Society of the

$$\frac{A_{\text{max}} - A_{\text{min}}}{A_{\text{max}}} \times 100$$

File-Tab 1.rr 0

Questions and answers

DISCUSSION

Starting Audio (200)

Questions and Answers

AVAILABLE: Library of Congress

1

On the Relaxation Ability of Refractory Compounds

the indenter of the micro-durometer for refractory compounds is a feature being sensitive to time. 2) The character of the time dependence is substantially equal for different classes of compounds, but remains equal for the compounds of one class. The shape of the curves depicts the structural characteristics of the compounds. The different angular coefficients show the varying relaxation ability as to the inner stresses. 3) When rating the strength of the interatomic bond in the refractory compounds by means of a mean square displacement of atoms in the crystalline lattice, it was determined that for carbides and nitrides this value changes within the limits of 0.670 to 0.180 Å, for silicides from 0.100 to 1.120 Å, and for nitrides more than 0.120 Å. Based on this fact, it can be said that certain compounds of the type mentioned possess the ability of relaxing the inner stresses in micro-volumes at room temperatures, and that this ability is determined by the class of the compound, its structure and the strength of the interatomic bond. There are 1 figure and 1 reference. 1. A. V. German and I. French.

ASSOCIATION Institut metal keramiki i spetsialnykh AN URSR Institut Metal
al-Ceramics and Special Alloys, AS UkrSSR,

SUBMITTED September 26 1959

Card 2/2

ANDRIYEVSKIY, R.A.; KHOLIYAVENKO, K.M.; PILYANKEVICH, A.E.

Comparative investigation by various methods of the specific
surface of metal powders. Vop. por. met. i prochn. mat. no.8:3-7
'60. (MIRA 13:8)
(Metal powders) (Surface chemistry)

PILYANOVICH, A.N.

Evaluating the brittleness of high-melting compounds in testing
by impression. Zav.lab. 26 no.1:9 '60. (MIRA 13:5)

1. Institut metallokeramiki i spetsial'nykh splavov Akademii
nauk USSR.

(Metals--Brittleness)

68214

On the determination of the criticalness of
difficultly fusible compounds in polymer
Tests

Doctor of Technical Sciences, Professor
member of the Academy of Sciences of the USSR
evaluation of the value of the criticalness of
the curves the dependence of the criticalness of
course of the curves is as follows:

$$a = \frac{1}{n} \left(\frac{dn}{dt} \right)_{t=t_c} \quad (1)$$

attractive potential of the polymer chain
given value of the criticalness of the polymer
(Fig. 1b) of the criticalness of the polymer
reliable results of the criticalness of the
ness curves with a given criticalness of the
of the criticalness of the polymer chain
vestigation of the criticalness of the polymer
as follows: $n_c = 10^4$ and $n_c = 10^5$.

The method of criticalness of the polymer
materials the grains of which are subjected
of fields of forces during the criticalness

Part 2/3

68214

On the Determination of the Brittleness of
Difficultly Fusible Compounds in Impressing
Tests

S/032/00/026/01/000-000
BC10/0000

7 references, 4 of which are Soviet

ASSOCIATION: Institut metallokeramiki i spetsial'nykh splavov Akademii Nauk
USSR (Institute of Powder Metallurgy and Special Alloys of
the Academy of Sciences of the UkrSSR)

Card 3/3

16.7800, 24.6000, 24.7000

77318
SOV 86-30-2-10 18

AUTHOR: Pilyankevich, A. N.

TITLE: Electron Scattering in an Electron Microscope

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol 30, Nr 1, 11-21-238 (USSR)

ABSTRACT: It is well known that for calculation of contrast in electron microscope images, for various effective apertures of the objective lens, one needs values of the effective cross section of the object atoms. Since the electron microscope objective aperture angles are usually small (of the order of 10^{-3} to 10^{-2} radians) the most important effect is the electron scattering for very small angles. Most elastic scattering calculations up to now were made using the integral expression developed by Mott (see reference)

Card 1/8

Electron Scattering in an Electron Microscope

77318

SOV. 57-30-1-11, 12

where z is atomic number of the scattering atom; a_0 is the Bohr radius; q is change in impulse of the scattered electron; θ is angle of scattering; and f is atomic scattering factor given by

$$f = \int_0^\infty \rho(r) \frac{\sin qr}{qr} 4\pi r^2 dr \quad (5)$$

Lower limit of integration in (5) is determined by the aperture angle of the objective lens α_0 . For small angle scattering, Lentz (Zs. Naturforsch., 1961, 16, 1) proposed a simplified expression

$$f = \frac{2\pi^2}{\alpha_0^2} \int_0^\infty \rho(r) \frac{1 - \cos qr}{q^2} 4\pi r^2 dr \quad (6)$$

Card 2/8

Electron Scattering in an Electron Microscope

where $\bar{r}^2$ is the mean square radius of the scattering atom. Although the Lenz approximation is widely in use, nobody even estimated the error introduced by using the approximation. Noting that there are regions where the atomic factor according to Mott differs considerably from that of Lenz (see Fig. 1), the author decided to compute the effective elastic scattering cross sections for Be, B, and C in the ground $1s$ state integrating numerically (6) and compare them to the results computed according to Lenz. Results are in Table 1. Table 2 also contains data about inelastic scattering computed using the correct quantum-mechanical scattering function, S

$$S = \sum_{l=0}^{\infty} f_l^2 \quad (11)$$

and also using the approximate classical expression

$$S = \pi f^2 \quad (12)$$

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Electron Scattering in an Electron Microscope

100-100-100-100

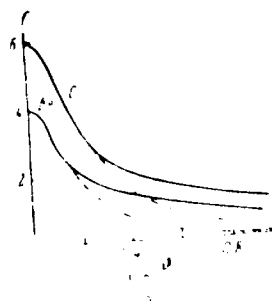


Fig. 1. Atomic scattering factor for Be at 100 kV. Solid lines are values computed according to Mott and Davis; dashed lines are values computed according to Debye.

Card 4/8

Electron Scattering in an Electric Magnetic Field

TABLE 1. Relationship between the values of Cross-Sections of the σ_e Electrons and the Angle of the θ of the

a	b	c			d			e			
		n _e	n	σ	n _e	n	σ	n _e	n	σ	
θ = 0	10 · 10 ⁻¹²	10 ⁻¹⁰	0.715	1.015	1.026	0.918	1.287	1.100	28.4	23.2	7.2
		10 ⁻⁹	5.291	6.207	1.094	5.095	6.233	1.103	2.0	0.1	0.1
		10 ⁻⁸	6.006	7.252	5.120	6.313	7.510	5.500	5.1	3.6	1.5
		n	7.1	5.9	1.3	5.9	1.8	1.0	20.5	18.5	6.5
θ = 5 · 10 ⁻⁴	10 · 10 ⁻¹²	10 ⁻¹⁰	0.713	1.011	0.982	0.9	1.283	1.098	28.4	23.2	11.8
		10 ⁻⁹	2.256	2.630	2.109	2.117	2.759	2.157	6.9	4.9	2.7
		10 ⁻⁸	2.967	3.631	3.021	3.027	4.012	3.255	12.1	10.1	5.5

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Electron Scattering in an Electron Microscope

TABLE

10^{-1}	$5 \cdot 10^{-2}$	10^{-1}	$5 \cdot 10^{-2}$	10^{-1}	$5 \cdot 10^{-2}$	10^{-1}	$5 \cdot 10^{-2}$	10^{-1}	$5 \cdot 10^{-2}$	10^{-1}	$5 \cdot 10^{-2}$
0.201	1.030	0.977	0.611	1.178	1.091	2.000	1.000	0.201	1.030	0.977	0.611
1.620	1.911	1.598	1.282	2.937	1.774	10.00	10.00	1.620	1.911	1.598	1.282
2.624	2.931	2.372	2.659	3.420	2.333	10.00	10.00	2.624	2.931	2.372	2.659
0.508	0.776	0.827	0.696	1.001	0.950	0.70	0.70	0.508	0.776	0.827	0.696
0.386	0.468	0.441	0.478	0.474	0.451	0.45	0.45	0.386	0.468	0.441	0.478
0.664	1.231	1.318	1.174	1.878	1.491	0.50	0.50	0.664	1.231	1.318	1.174
0.267	0.134	0.758	0.303	0.600	0.655	0.20	0.20	0.267	0.134	0.758	0.303
0.109	0.153	0.781	0.365	0.203	0.223	0.10	0.10	0.109	0.153	0.781	0.365
0.374	0.882	0.709	0.508	0.803	0.878	0.10	0.10	0.374	0.882	0.709	0.508

Key to Table : (0) Absent; (1) Correct; (2) Error
Assigned to Model : (1) Assigned to Model ; (2) Error;
error.

Card 6/8

Electron Scattering in an Electron Microscope

NOV 1971

as was done by Lenz. In (11) f_i is the scattering factor due to the i -th electron in the atom, and f in (12) is computed using Eq. (7). The author notes that the Lenz equation for inelastic scattering cross-section is more correct than that for the elastic cross-section. The relative difference between the latter and the Mo equation increases from 10 to 50% with the increase in the aperture angle. Table 2 contains the ratio of the inelastic and elastic total cross-sections.

$$\sigma_{\text{in}} = \sigma_{\text{el}} + \sigma_{\text{in}} \quad (16)$$

and the total effective cross-section $\sigma = \sigma_{\text{el}} + \sigma_{\text{in}}$. The author also investigated the angular distribution of the elastic and inelastic scattered electrons and found that the corresponding Lenz equations are sufficiently

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Electron Scattering in an Electron Microscope

73188

NOV 17 - 1968

accurate for small scattering angles θ ($\theta < 10^\circ$) if λ is below 0.1 to 0.2 λ . There are 7 German, 1 French, and 10 references, 1 Soviet, 1 Italian, 1 German, 1 U.S., 2 U.S. The U.K. and U.S. references are: M. Harker, *Sci. Instr.*, **34**, 1 (1961); E. Williams, *Proc. Roy. Soc.*, **199A**, 41 (1949); N. Mett, *Proc. Roy. Soc.*, **130**, 1 (1930); A. Compton, *Phys. Rev.*, **35**, 950 (1930); D. Hartree, *Proc. Roy. Soc.*, **147**, 110 (1934).

ASSOCIATION: Institute for Metallodermatology and Chemical Technology,
USSR, Kiev (Institute of Metallodermatology and Chemical Technology,
splanov AN USSR, Kiev)

SUBMITTED: September 4, 1964

Card 8/8

16.7800, 24.6000, 24.7000

AUTHOR: Pilyavskiy, A. M.

TITLE: Electron Scattering by Light Atoms

PERIODICAL: Zhurnal tekhnicheskoy fiziki, No. 1, 1978, No. 1, p. 231 (USSR)

ABSTRACT: As shown by M. P. (Pilyavskiy, A. M.), an analogy between the scattering of electrons and the scattering of light by atoms is established. The relative intensity of scattering at an angle θ with the direction of the incident beam is given by

$$\frac{I}{I_0} = \frac{r_p(\theta)}{r_p(0)} + S_p(\theta),$$

where $r_p(\theta)$ is the scattering function of the scattering potential $V(r)$ (Pilyavskiy, A. M., 1978, Zhurnal tekhnicheskoy fiziki, No. 1, p. 231).

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Electron Scattering by Light Atoms

Let I_0 be the incident intensity of the light beam. The scattered intensity I_s can be written as the sum of the

$$\frac{I_s}{I_0} = \text{const} (J_{\text{sc}}^2 + S_{\text{sc}}^2), \quad (6)$$

where

$$J_{\text{sc}} = \frac{(r - r_p)}{(10^{-10} \text{ cm})^2}, \quad (4)$$

AND

$$S_{\text{sc}} = \frac{S_p}{(10^{-10} \text{ cm})^2}, \quad (5)$$

Card 1

Electron Scattering by Light Atoms

77417
DOV 11-11-19 17

Since knowledge of the atomic structure and interactions is needed for computation of many practical and practical effects including electron scattering, the author computed f_0 , f_1 , f_2 , and f_3 for the ground 2P states of H^{++} , H , He , Li^{++} , Li^+ , and Be . Table 1 lists the values of f_0 and f_2 . The author also computed the f_1 factors for electrons in the $1s$, $2s$, and $3s$ states. He gave the partial cross section σ_{λ} for the following reasons: (1) well known scattering cross section $\sigma_{\lambda} = \frac{1}{2} \sigma_{\lambda}^{(0)} + \frac{1}{2} \sigma_{\lambda}^{(1)}$ are important for electron scattering; (2) σ_{λ} is a function of λ^{-1} and allowed a comparison with the results obtained by Vaynshteyn; (3) σ_{λ} is a function of λ^{-1} and calculations of elastic and inelastic scattering cross sections. The author notes that the disagreement with the "inverse course" law of Vaynshteyn (DANILIN, 1964, 1965) in the case of H^{++} is due to the use of the Hartree-Fock method, not taking into account the electron correlation effect. (The "inverse course" law states that there is

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Electron Scattering by Light Atoms

TABLE 1. Atomic scattering factors for electrons

$\sin \theta / \lambda$	H		He		Li		Be		B		C		N		O		F		Ne	
	f_p	f_{rel}	f_p	f_{rel}	f_p	f_{rel}	f_p	f_{rel}	f_p	f_{rel}	f_p	f_{rel}	f_p	f_{rel}	f_p	f_{rel}	f_p	f_{rel}	f_p	f_{rel}
0.000	1.000	1.272	5.000	1.414	6.041	1.010	2.000	1.1	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.005	3.997	1.272	4.996	1.410	5.997	1.012	2.000	1.1	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.01	3.987	1.272	4.986	1.407	5.993	1.014	2.000	1.1	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.02	3.950	1.253	4.943	1.415	5.959	1.014	1.999	1.1	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.03	3.887	1.248	4.875	1.392	5.910	1.016	1.997	1.1	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.04	3.817	1.249	4.782	1.361	5.841	0.999	1.995	1.1	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.05	3.707	1.173	4.669	1.333	5.735	0.979	1.991	1.1	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.10	3.056	0.931	3.921	1.079	5.125	0.823	1.996	1.1	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.20	2.060	0.185	2.576	0.609	3.381	0.603	1.820	0.1	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.4	1.521	0.155	1.678	0.208	1.906	0.283	1.582	0.1	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.6	0.195	0.078	1.418	0.104	1.556	0.123	1.184	0.0	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
0.8	0.875	0.049	1.151	0.060	1.323	0.073	0.883	0.0	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
1.0	0.619	0.031	1.146	0.041	1.111	0.049	0.603	0.0	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
1.5	0.266	0.017	0.450	0.020	0.613	0.024	0.254	0.0	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000
2.0	0.094	0.010	0.227	0.012	0.475	0.014	0.113	0.0	3.000	1.000	4.000	1.000	5.000	1.000	6.000	1.000	7.000	1.000	8.000	1.000

Card 4/7

Electron scattering by light Atom

1994-1995

Key: () = True; () = False; () = Neither () = Indeterminate; () = True; () = False; () = Indeterminate

[illegible]

Card 6/7

PHASE I BOOK EXPLOITATION SOV/5589

Pilyankevich, Aleksandr Nikolayevich

Praktika elektronnoy mikroskopii; metody preparirovaniya (Practice of Electronic Microscopy; Methods of [Specimen] Preparation) Moscow, Mashgiz, 1961. 175 p. Errata slip inserted. 5,500 copies printed.

Reviewer: Yu. B. Malevskiy, Candidate of Technical Sciences; Ed.: P. Ya. Furer; Tech. Ed.: M. S. Gornostaypol'skaya; Chief Ed., Mashgiz (Southern Dept.): V. K. Serdyuk, Engineer.

PURPOSE : This book is intended for workers in electron microscope laboratories and for students in departments of metal science.

COVERAGE: The book deals with electron microscope research methods for various specimens. Direct research methods with translucent-type electron microscopes, including the preparation of film supports and specimens, are described in detail. Indirect research for studying large object surfaces by means of one- and two-stage replicas are also covered. Methods for increasing contrast and for the evaluation of resolution of replicas are described,

Card 1/5

Practice of Electronic (Cont.)

SOV/5589

along with the procedures used in preparing metallographic sections, fracture surfaces, ceramics, small-size objects, and fibers for electron microscope study. The material includes 44 photos of replicas, fracture surfaces, and specimens. The author thanks G. V. Samsonov, Doctor of Technical Sciences, and I. N. Frantsevich, Corresponding Member AS UkrSSR. There are 173 references: 69 English, 46 Soviet, 34 German, and 24 French.

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Card 2/5	

S/194/62/COG/006/177/012
D201/D308

AUTHOR: Pilyankevich, A.N.

TITLE: Electron microscope practice. Methods of (specimen) preparation

1. MEDICAL: Referativnyy zhurnal. Avtomatika i radicelektronika, no. 6, 1962, 51, abstract 6Zh333 (Moscow - Kiev, Tekhniz, 1961, 176 p.)

ABSTRACT: The book explains the basic methods of electron microscopy analysis of various objects. The methods of direct analysis are considered in detail both for shadow type microscope (preparation of base film layers, preparation of the specimen etc.) and for indirect studies of surfaces of bulky specimens using single and double replica techniques. Methods of increasing the contrast and of increasing the resolving power of replicas of various types are given together with the details of methods of preparation of various specimens for electron-microscopy analysis: lapped metal surfaces, surfaces of fractures, ceramics, small size specimens and fibers. The emphasis is laid on the practical applications of the subject; in Card 1/2

PILYANKEVICH, A.N.

Some laws governing the elastic scattering of medium-energy electrons. *Kristallografiia* 6 no. 3:321-327 Aug-Je '61. (MIRA 14 8

1. Institut metallokeramiki i spetsial'nykh splavov N U.S.S.R.
(Electrons--Scattering)

PIIYANKEVICH, A.N.

Calculation of the characteristics of the scattering of mean energy
electrons on free atoms. Radiotekh. i elektron (no. 1374-1377)
Ag '61. (MIRA 14:7)

1. Institut metallokeramiki i spetsial'nykh splavov AN USSR.
(Electrons--Scattering)

15.2220

AUTHORS: Pilyankevich, A. N. and Pravoslavina, I. N.

TITLE: On the Comparative Characteristics of the Properties of
High Temperature Compounds (of refractory compounds: Kazateliyakh
Krupitskiy Kugelskiy Kovalevskiy)

PERIODICAL: Fizika i khimiya metallov i spetsialnykh materialov (USSR) No. 3, pp. 40-43

ABSTRACT: Slightly Abridged Translation.

The basic physical (mechanical, thermal, and crystallographic chemical) properties of carbides, nitrides, silicides and nitrides have been studied very little. Hence the heat-resistant compositions had to be found empirically. As a result of many investigations the following were found to be the most promising compositions based on titanium carbide, silicon carbide, boron carbide, several borides, silicides and among them particularly molybdenum disilicide, carbosilicides and their compounds related to known phases as regards their crystal-chemical nature, nitrides (silicon nitride and boron nitride) and some of the refractory oxides (Al₂O₃, ZrO₂, BaO and others). The diagram of Fig. 1

On the Comparative Character of the Effect of Temperature Compounds

illustrates the relationship between the effect of temperature at 1000°C for a few selected materials of different chemical compositions. The results show that the effect of temperature as well as the insufficient effect of these materials on the formation of shock is associated with the fact that the rate of propagation of fracture is not very high and the materials are not able to resist the action of thermal stresses. The influence of brittleness on the mechanical properties of highly refractory materials is not very pronounced, but the brittleness of metallic or non-metallic materials is a serious defect in the structure and increases the risk of fracture of the material, or by adequate measures of the material, such as the use of a support. However, it is possible to obtain a certain degree of resistance to the application of high temperature by the use of a certain type of construction by decreasing the rate of propagation of the action of the supporting structure. The results of the development of investigation in this direction are given, first of all, to obtain a certain degree of resistance to the action of the brittleness of the materials and to their pure phases and phases of the materials.

On the Comparative Characteristics of the Brittleness of High Temperature Compounds

work is concerned with the solution of this problem. For a comparative estimation of the brittleness of various refractory compounds, the authors used an electron microscopic method for the study of the fractures of these bodies, as well as a statistic microdurometry method. An electron optical fractographic method has been described in detail by Pilyankevich (Ref.2). By this method the authors obtained the fracture structures of polycrystalline specimens of silicon, β -silicon carbide, zirconium carbide, titanium carbide and niobium boride (see Figs.2-5). It can be assumed that those phases in which fracture occurs along perfect cleavage planes (Si and NbB₂) must be characterised by a lowering in resistance to fracture and an increase in brittleness; phases with complex structure of block fractures (β -SiC, ZrC, TiC) must be less brittle. These qualitative phase characteristics find quantitative confirmation in statistic relative brittleness curves. For the plotting of curves (see Fig.6) the authors used a method in which the

Card 3/4 non-fractured prints of the indenter of the microdurometer

On the Comparative Characteristics of the Properties of High Temperature Compounds

PMT-3, applied to the crystalline particles in the micro-section, were counted for various leads (as a percentage of the total number of particles). The lowest curve characterizes the most brittle material investigated (Si). The highest curve the most plastic. It has been found that the "most plastic" and the most thermal shock-resisting metallo-ceramic refractory materials investigated so far are titanium carbide based compositions.

There are 6 figures and 3 references. Of which 1 is Soviet, 1 English and 1 German.

ASSOCIATION: Institut metallokeramiki i spetsial. legirovaniy
AN USSR (Institute of Metallo-ceramics and Special Alloys,
Ac. Sc. Ukrainian SSR)

SUBMITTED: July 22, 1957

Card 4/4

S/057/61/031/002/011/015
B124/B202

26.2340

AUTHOR: Pilyankevich, A. N.

TITLE: Calculation of the characteristics of inelastic scattering of medium-energy electrons

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 2, 1961, 224-230

TEXT: The author discusses some problems which are related to the inelastic electron scattering from isolated atoms. In this case, the electron energy is assumed to be sufficiently high for Born approximation and sufficiently small for the neglect of relativistic effects. According to P. M. Morse's theory (Ref. 1) the differential inelastic electron scattering cross section from an isolated atom can be determined from relation

$$\frac{d\sigma_1}{d\Omega} = \frac{4}{a_0^2 q^4} (Z - F). \quad (1)$$

where $(Z - F)$ is a function of incoherent (Compton) scattering for X-rays (Z denotes the atomic number of the scattering atom), a_0 the atomic unit

Card 1/1

89165

S/057/61/031/002/011/015
B124/B202

Calculation of the characteristics...

of length, q the change of the wave vector of the scattering electron due to scattering $|q| = \sqrt{k^2 + k'^2 - 2kk'\cos 2\theta}$, (2) where 2θ is the scattering angle, $\vec{k}$ and $\vec{k}'$ the wave vector of the electron before and after scattering. Equation

$$Z - F = \sum_{n, n'} \left[\sum_{k=0}^{\infty} \frac{(-1)^k q^{2k} \langle r_{n, n'}^{2k} \rangle}{2^k \cdot 1.3.5 \dots (2k+1) k!} \right]^2 +$$

$$+ \sum_{n, n'} \left[\sum_{k=0}^{\infty} \frac{(-1)^k q^{2k+1} \langle r_{n, n'}^{2k+1} \rangle}{2^k \cdot 1.3.5 \dots (2k+3) k!} \right]^2 + \sum_{n, n'} \left[\sum_{k=0}^{\infty} \frac{(-1)^k q^{2k} \langle r_{n, n'}^{2k} \rangle}{2^k \cdot k! \cdot 1.3.5 \dots (2k+1) k!} \right]^2 +$$

$$+ \sum_{n, n'} \left[\sum_{k=0}^{\infty} \frac{(-1)^{2k} q^{2k+2} \langle r_{n, n'}^{2k+2} \rangle}{2^k \cdot 1.3.5 \dots (2k+5) k!} \right]^2. \quad (14)$$

is then derived and the first two terms of the expansion into a series ($k=0,1$) and the conditions of orthonormalization are taken into account which have the form

$$\langle r_{n, n'}^0 \rangle = \begin{cases} 1 & \text{при } n = n', \\ 0 & \text{при } n \neq n'; \end{cases}$$

$$\langle r_{n, n'}^1 \rangle = \begin{cases} 1 & \text{при } n = n', \\ 0 & \text{при } n \neq n'. \end{cases}$$

Card 2/8

S/C57/61/031/002/011/015
B124/E202

Calculation of the characteristics...

In this case $Z-F = \frac{q^2}{3}(\bar{R}^2 - R_1^2) - \frac{q^4}{60} \left[\bar{R}^4 + \frac{5}{3}(\bar{R}^2)^2 + R_2^4 \right] + O(q^6)$, (16) holds, whereas the first terms of the expansion of the function of incoherent scattering have the form

$$(Z-F)_{\text{incoh}} = \frac{q^2}{3} \bar{R}^2 - \frac{q^4}{60} \left[\bar{R}^4 + \frac{5}{3}(\bar{R}^2)^2 \right] + O(q^6), \quad (17)$$

without taking account of the exchangeable terms. For reasons of simplicity,

$$\bar{R}^2 = \sum_{i=1}^Z \langle r_{ii}^2 \rangle; \quad \bar{R}^4 = \sum_{i=1}^Z \langle r_{ii}^4 \rangle; \quad (\bar{R}^2)^2 = \sum_{i=1}^Z \langle r_{ii}^2 \rangle^2. \quad (18)$$

is introduced into (17). The correction factor R_1^2 is related to the fact that ns - n'p and np - n'd of the wave functions intersect one another.

Thus the function of inelastic electron scattering $q^{-4}(Z-F)$ is practically unchanged. For sodium ($^2S: 1s^2 2s^2 2p^6 3s^1$) the equation for R_1^2 has the form

$$R_1^2 = 4\langle r_{1s2p} \rangle^2 + 4\langle r_{2s2p} \rangle^2 + 2\langle r_{3s2p} \rangle^2. \quad (18a)$$

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Calculation of the characteristics...

Using the values for $\langle r_{ij}^R \rangle$ given in Table 1, $R_1^2 = 2.5248a_0^2$ for sodium which is approximately 10% of $\bar{R}^2$. The correction factor R_2^4 is due to the equal values of all single-electron wave functions; for Li it is $0.2757a_0^4$, for Be $0.1784a_0^4$, and for Na $0.1314a_0^4$. The Figure shows the differential scattering cross section for Li, Be, and Na-atoms which were calculated from Eq. (1). For $\sin \theta / \lambda > 0.05 \text{ \AA}^{-1}$ the incoherent scattering function $Z - F$ was calculated from equation

$$(Z - F) = Z - \sum_{i,j} \left\{ \sum_n \sum_k \frac{(-1)^k C_n q^{n+k}}{2^k [1.3.5 \dots (2n+2k+1)] k!} \langle r_{ij}^{n+k} \rangle \right\}. \quad (12)$$

and for $\sin \theta / \lambda \gg 0.05 \text{ \AA}^{-1}$ by numerical integration of equation

$$f_{ij} = \sum_n C_n \int_0^\infty P_1(r) P_j(r) j_n(qr) dr. \quad (*)$$

(where $P_1(r)$ denotes the radial parts of the single-electron wave func-

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Calculation of the characteristics...

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tions. $j_n(qr)$ specific Bessel functions of n -th order and C_n constant coefficients depending on the orbital quantum numbers of the i - and j -electron pair concerned. These quantities are given in Ref. 8, by using the self-consistent field functions (Refs. 2-4). The results of integration are given in Table 2. To calculate the total inelastic electron scattering cross section integral

$$\sigma_{\text{in}} = \frac{2\pi^2}{\hbar^2 a_0^2} \int_{\epsilon_{\text{min}}}^{\epsilon_{\text{max}}} \frac{Z - F}{\epsilon^2} d\epsilon \quad (20)$$

must be calculated, where ϵ_{max} is taken as upper, and relation $\epsilon_{\text{min}} = \frac{\hbar^2}{2m} \frac{\Delta E}{\epsilon_0}$ as lower limit, and where ΔE is assumed to be equal to half the ionization energy. The values of the total inelastic scattering cross sections calculated from (20) are given in Table 2 in certain approximation. The same table also contains values of the inelastic scattering cross sections through an angle which is larger than an given angle θ_0 . There are 1 figure, 1 tables, and 12 references: 1 Soviet-100 and 9 non-Soviet-100.

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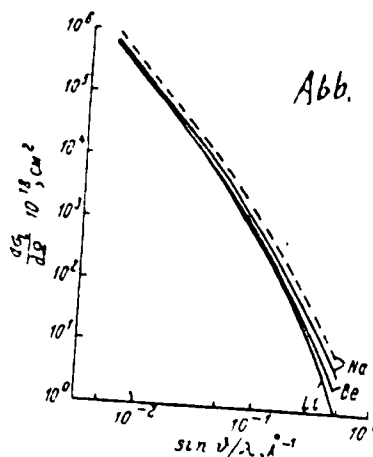
Calculation of the characteristics...

S/057/6: 011/000/011/015
B'24/2202

ASSOCIATION: Institut Metalokeramiki i spetsial'nykh splavov AN USSR,
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SUBMITTED: April 18, 1960

Legend to the Figure: The dashed
line shows the differential in-
elastic electron scattering cross
section from Na-atoms calculated
without consideration of the
exchangeable terms.



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S/020/61/141/004/017/01
B103/B101

AUTHORS: Stoyanova, I. G., and Pilyankevich, A. N.

TITLE: Choice of accelerating voltage in the electron microscope for studying processes in living cells

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 4, 1961, 371-375

TEXT: This paper deals with the determination of the accelerating voltage at which processes in living cells can be observed on a submicroscopic level (20 - 50 Å). The contrast in images of thin objects is uniquely defined by the difference $\Delta(\rho d)$ of the mass thicknesses of neighboring sections of the object; the greater $\Delta(\rho d)$, the higher the contrast (ρ - specific weight). Under given conditions a definite quantity of substance $\Lambda(\rho d)$ exists which guarantees a minimum contrast which can be photographically recorded with sufficient reliability ($K_{\min} = 0.1$). Since ρ is approximately constant in biological objects, one may pass from the minimum quantity of the substance $\Delta(\rho d) = \rho \Delta d$ to the minimum thickness Δd . This thickness is characterized by the minimum contrast curves $(MCC) \Delta d_{c=0.1} = f(U)$. These curves prove that a particle thinner than Δd

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